



Indiana State Department of Health

Epidemiology Resource Center

Quick Facts

About...Primary Amebic Meningoencephalitis (PAM)

What is PAM?

PAM is a rare, but very serious, infection in the brain caused by the free-living ameba, *Naegleria (nay-GLEER-e-uh) fowleri*. To date, there has been only one case of PAM in Indiana.

How is Naegleria spread?

Naegleria is a naturally occurring, free-living ameba found in warm freshwater. Infection most often occurs when swimmers in warm freshwater bodies get water up their noses. Infection has also occurred during cleansing of nasal passages, such as during religious practices or nasal irrigation. You **cannot** be infected with Naegleria by drinking contaminated water and you **cannot** get it from another person.

Who is at risk for PAM?

PAM can affect anybody. Since Naegleria enters the body through the nose, people who submerge their head in fresh water are at risk. Those who clean their nose by nasal irrigation are also at risk.

How do I know if I have PAM?

The first symptoms of PAM occur 1-7 days after exposure and are like meningitis:

Stage 1

- Severe headache
- Fever
- Nausea
- Vomiting

Stage 2

- Stiff neck
- Seizures
- Altered mental status/
Hallucinations
- Coma

How can PAM be treated?

PAM is often fatal, even with treatment. A quick diagnosis and aggressive treatment may increase chances of survival. PAM is typically treated with antifungal injections.

How is PAM prevented?

Naegleria is a naturally occurring organism. Anything that limits water going up the nose will reduce the risk of developing PAM. The CDC recommends the following for swimmers:

- Hold your nose shut, use nose clips, or keep your head above water when taking part in water-related activities in warm freshwater.
- Avoid putting your head under the water in hot springs and other untreated thermal waters.
- Avoid water-related activities in warm freshwater during periods of high water temperature and low water levels.
- Avoid digging in, or stirring up, the sediment while taking part in water-related activities in shallow, warm freshwater areas.

To reduce risk during nasal irrigation, the CDC recommends the following:

- Always use water that has been:
 - Previously boiled for 1 minute and left to cool, or
 - Filtered, using a filter with an absolute pore size of 1 micron or smaller, or
 - Purchased with a label specifying that it contains distilled or sterile water
- Be sure to rinse the irrigation device after each use with water that has been previously boiled, filtered, distilled, or sterilized and leave the device open to air dry completely

All information presented is intended for public use. For more information, please refer to: <http://www.cdc.gov/parasites/Naegleria/>.

This page was last reviewed September 17, 2013.